

Urban Air Pollution

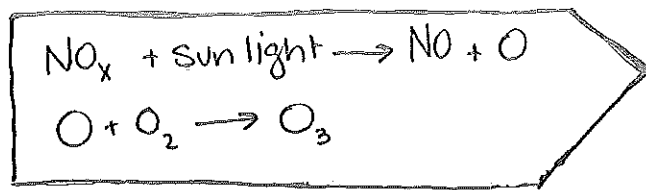
5.7.1 State the source and outline the effect of tropospheric ozone.(O₃)

* Ozone is good in the Stratosphere & Bad in the Troposphere.

↙
in the Stratosphere
ozone is made by
sunlight splitting oxygen

↓
in the Troposphere
ozone is formed by sun &

VOCs (volatile organic
compounds), hydrocarbons
& NO_x



VOCs & NO_x come from
Road transport, paints,
glues, petrol

NO_x, NO₂ come from
combustion

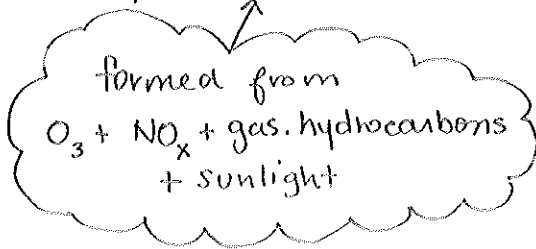
↪ Because this process
requires sunlight →
Biggest issue during the
day

Effects

- Animals - O₃ can harm lung tissue,
hurt their immune system, ↑ respiratory
tract infections, aggravate asthma, bronchitis, &
pneumonia
→ long term - premature aging of lungs
→ reduced lung capacity
- Plants - may cause dieback in forests
affect photosynthesis & growth
Reduces crop yield
Reduce arable land

5.7.2 Outline the formation of photochemical smog

photochemical smog vs. industrial smog



* Maximum @ high Sunlight

* Most often in the Summer (lots of Sun)



Nitrogen (N_2)

Oxygen (O_2)

Burning

Nitric oxide (NO)

Oxygen (O_2)

Nitrogen dioxide (NO_2)

UV radiation

Water vapor (H_2O)

Hydrocarbons

Nitric oxide (NO)

and

Oxygen atom (O)

Oxygen (O_2)

Ozone (O_3)

Volatile organic compounds (VOCs)

Various pollutants

Nitric oxide (NO)

and

Nitric acid (HNO_3)

Acid rain

Peroxyacyl nitrates (PANs)

See notes on Acid Precipitation

(a) Formation of photochemical smog

* No sunlight needed

* London-type smog

* Lots of SO_x due to increased heating of homes, offices, & industries

Temperature Inversion:

This is Part of Beijing's Problem

